oscillating probe and the boost module boosts a probe drive signal to the oscillating probe based on the phase signal detected by the detector module to produce a boosted probe drive signal.

2. (Twice Amended) The apparatus according to claim 1, wherein the detector module comprises:

a precision full wave rectifier; and

an envelope detector coupled to the precision full wave rectifier,

wherein the precision full wave rectifier rectifies a phase signal of the oscillating probe to produce a rectified phase signal and the envelope detector detects the rectified phase signal to produce an envelope detected signal.

3. (Amended) The apparatus according to claim 2, wherein the detector module further comprises:

a comparator coupled to the envelope detector; and

an event detector and hold off circuit coupled to the comparator,

wherein the comparator and the event detector and hold off circuit generate an event signal from the envelope detected signal.

4. (Three Times Amended) The apparatus according to claim 3, wherein the boost module further comprises a multiplier coupled to the event detector and hold off circuit; and

wherein the multiplier combines the event signal with the probe drive signal to produce the boosted probe drive signal.

5. Cancelled

6. (Amended) The apparatus according to claim 4, wherein the boost circuit further comprises an event level setting circuit coupled between the event detector and hold off circuit and the multiplier of the boost circuit, wherein the event level setting circuit sets an event level of the event signal.

7. (Amended) The apparatus according to claim 4, wherein the boosted probe drive signal is boosted 20 to 30 percent of the probe drive signal above the probe drive signal.

8. (Amended) The apparatus according to claim 3, wherein the event detector and hold off circuit delays the generation of the event signal for a predetermined time.

9. (Twice Amended) A method for reducing the parachuting of an oscillating probe obtaining accurate information representative of a surface of a sample comprising:

scanning the surface of the sample the oscillating probe;

measuring an oscillation of the oscillating probe so as to generate a phase signal;

detecting a reduction of a variation of the phase signal of the oscillating probe indicative of free oscillation of the oscillating probe; and

reducing a distance between the oscillating probe and the sample in response to the detection of the reduction of the variation of the phase signal of the oscillating probe.

10. (Amended) The method according to claim 9, wherein the detecting step further comprises:

rectifying the phase signal of the oscillating probe to produce a rectified phase signal; and

envelope detecting the rectified phase signal of the oscillating probe to produce an envelope detected phase signal of the oscillating probe.

11. (Amended) The method according to claim 9, wherein the reducing step further comprises boosting a probe drive signal of the oscillating probe to produce a boosted drive signal of the oscillating probe.

12. (Twice Amended) The method according to claim 11, wherein the detecting step further comprises generating an event trigger signal based on the detected phase signal with a comparator and the boosting step further comprises boosting the probe drive signal of the

oscillating probe by combining the event trigger signal with the probe drive signal of the oscillating probe to produce a boosted drive amplitude signal.

13. (Amended) The method according to claim 12, wherein the detecting step further comprises delaying the generation of the event trigger signal for a predetermined time.

14. (Amended) The method according to claim 11, wherein the boosted drive signal is 20 to 30 percent of the probe drive signal above than the probe drive signal.

15. (Amended) The method according to claim 9, further comprising:

detecting an error signal of the oscillating probe when the oscillating amplitude of the oscillating probe is too high; and

accumulating the error signal of the oscillating probe.

16. (Amended) The method according to claim 9, further comprising:

detecting an error signal of the oscillating probe when the oscillating amplitude of the oscillating probe is too small; and

accumulating the error signal of the oscillating probe.

17. (Amended) The method according to claim 9, wherein the detecting step detects a reduction of a variation of a phase signal when the phase difference between a probe drive signal and a probe response signal is substantially 90 degrees.

18. (Amended) The method according the claim 9, wherein the reducing step further comprises boosting a probe drive signal of the oscillating probe to increase the accumulation of an error signal of the oscillating probe.

19. (Three Times Amended) An apparatus for reducing the parachuting of a probe measuring the topography of a surface comprising:

a detection module coupled to the probe to detect parachuting of the probe;

a boost module coupled to the detection module, wherein the boost module reduces the parachuting of the probe in response to the detection of parachuting of the probe.

20. (Amended) The apparatus according to claim 19, wherein the parachuting detection circuitry comprises a detector module and the parachuting reduction circuitry comprises a boost module.

In The Drawings:

Applicant has amended Figures 1 and 5, and has attached these figures showing the changes in "red."